

Issued December 12, 1910.

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF SOILS—MILTON WHITNEY, Chief.

SOIL SURVEY OF SUMNER COUNTY,
TENNESSEE.

BY

CHARLES N. MOONEY, ORLA L. AYRS, AND
JAMES L. BURGESS.

[Advance Sheets—Field Operations of the Bureau of Soils, 1909.]



WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1910.

[PUBLIC RESOLUTION—No. 9]

JOINT RESOLUTION Amending public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, "providing for the printing annually of the report on field operations of the Division of Soils, Department of Agriculture."

Resolved by the Senate and House of Representatives of the United States of America in Congress assembled, That public resolution numbered eight, Fifty-sixth Congress, second session, approved February twenty-third, nineteen hundred and one, be amended by striking out all after the resolving clause and inserting in lieu thereof the following:

That there shall be printed ten thousand five hundred copies of the report on field operations of the Division of Soils, Department of Agriculture, of which one thousand five hundred copies shall be for the use of the Senate, three thousand copies for the use of the House of Representatives, and six thousand copies for the use of the Department of Agriculture: *Provided*, That in addition to the number of copies above provided for there shall be printed, as soon as the manuscript can be prepared, with the necessary maps and illustrations to accompany it, a report on each area surveyed, in the form of advance sheets, bound in paper covers, of which five hundred copies shall be for the use of each Senator from the State, two thousand copies for the use of each Representative for the congressional district or districts in which the survey is made, and one thousand copies for the use of the Department of Agriculture.

Approved, March 14, 1904.

[On July 1, 1961, the Division of Soils was reorganized as the Bureau of Soils.]

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LETTER OF TRANSMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
BUREAU OF SOILS,

Washington, D. C., July 30, 1910.

SIR: The accompanying report and soil map cover the survey of Sumner County, Tennessee, one of the projects undertaken by the Bureau during the field season of 1909. A petition, signed by many prominent citizens of the county, requesting that this survey be made, was indorsed and transmitted to the Bureau by the Hon. Cordell Hull, within whose district the area lies.

I recommend the publication of this report as advance sheets of Field Operations of the Bureau of Soils, 1909, as provided by law.

Very respectfully,

MILTON WHITNEY,
Chief of Bureau.

Hon. JAMES WILSON,
Secretary of Agriculture.

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MAP.

Soil map, Sumner County sheet, Tennessee.

SOIL SURVEY OF SUMNER COUNTY, TENNESSEE.

By CHARLES N. MOONEY, ORLA L. AYRS, and JAMES L. BURGESS.

DESCRIPTION OF THE AREA.

Sumner County is situated in Middle Tennessee, being one of the northern tier of counties. It is bounded on the east by Macon and Trousdale counties and on the west by Robertson County, the line between the two counties following the old Louisville and Nashville turnpike, and on the south and southwest by the Cumberland River and Mansker Creek, which separate Sumner from Wilson County on the south and from Davidson County on the southwest. The Cumberland flows in a tortuous course, with a number of large

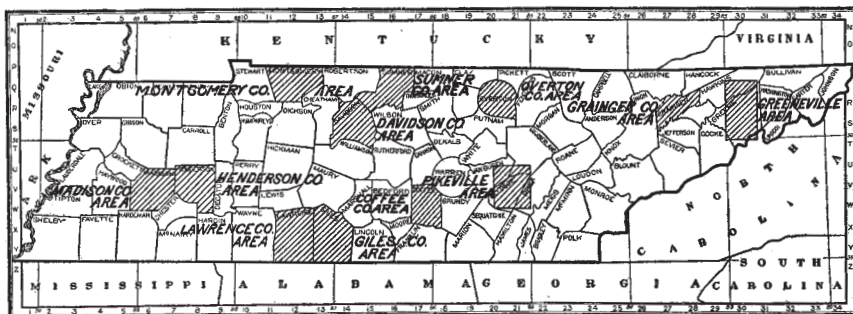


FIG. 1.—Sketch map showing location of the Sumner County area, Tennessee.

horseshoe bends, giving a very irregular boundary line. The county comprises approximately 363,520 acres, or 568 square miles.

The surface of Sumner County is varied, ranging in altitude from 450 feet above sea level where the Cumberland River leaves the county to 1,000 feet or more on the highest ridges in the northern part of the county. Parts of two physiographic divisions, the Central Basin and the Highland Rim, differing markedly geologically as well as topographically, are included. The Central Basin occupies the southern third of the county and is characterized by a rolling or undulating surface, with an average elevation of 600 feet above the sea or 100 to 200 feet above the Cumberland River, from which it rises for the most part rather gradually. To the north this province merges into the higher or hilly section of the county,

with very irregularly defined boundary. The slopes are as a rule long and gentle and are subjected to very little erosion, though in places along stream courses they may become steep and rocky and in the outer bends even precipitous. The streams are not numerous. Sink holes are a prominent feature of the topography.

The Highland Rim consists of a much-dissected plateau, with an average elevation of about 1,000 feet above sea or 400 feet above the Central Basin. In detail it consists of narrow, irregular-shaped ridges with steep and more or less stony slopes, forming narrow V-shaped ravines and valleys along the streams which flow 100 feet or more below, and flat or undulating ridges in the stream divides. The most extensive of the flat or undulating areas is in the northern part of the county, reaching to the east several miles from the Robertson County line on the west and north to the Kentucky state line, its continuity being broken by Drake Creek and the tributary streams. All along the southern part of the Rim the topography is broken and rough, with narrow, steep-sided ridges extending out into the Central Basin, and this section, which is the junction between the two physiographic divisions, is the roughest portion of the county. Along the lower courses of the streams narrow bottoms have been built up; along the larger streams they rarely reach a width of a quarter of a mile, while in the horseshoe bends of the Cumberland River they are a quarter of a mile or more in width. The larger part of the county lies in the Cumberland River basin.

The main streams draining the county to the south directly into the Cumberland are Bledsoe Creek in the eastern part, Station Camp Creek in the central, and Drake Creek in the western part. These creeks with their tributaries reach up to the divide on the Highland Rim, draining altogether fully two-thirds of the county. The north-western part of the county is drained by Red River and its branches, the main stream flowing some 50 miles to the west and emptying into the Cumberland at Clarksville in Montgomery County. The north-central part of the county is drained by the West and Middle forks of Drake Creek (there being two large creeks in the county by this name) and Sulphur Fork, while the northeastern part is drained by Little and Big Trammel creeks, the latter being just outside the eastern boundary of the county. These streams flow north, emptying into Barren River in Kentucky, the waters finally reaching the Ohio through the Stone River.

The Cumberland River is a navigable stream. All the creeks are swift-flowing streams, parts of their courses being over rocky floors. The smaller streams and branches are generally of intermittent character, going dry in the summer except where fed by constant flowing springs. Numerous springs in the Highland Rim section afford excellent water.

The surface drainage is rapid and after heavy rains the streams rise rapidly to the flood stage and often do much damage. Some of the drainage, however, goes into sink-holes which connect with subterranean streams.

Sumner County was first visited by white men in 1765, when Henry Scaggs, a pioneer and hunter, explored what became known as the Cumberland country and established his camp on Manskers Lick in the southwestern part of the county. Twelve years latter, or in 1777, Thomas Spencer and others, attracted by the accounts given of the Cumberland country, came to the section and built a number of cabins about one-half mile west of Bledsoes Lick, now known as Castalian Springs. The following year, it is said, about a dozen families came and settled at this same point, and a year later others came. In 1786 another settlement was begun on Station Camp Creek, and from this date settlement was quite rapid over the county, the early settlers locating along the stream courses. By 1830 the population of Sumner County is reported to have been 20,606.

Sumner County was organized in 1786 under an act passed by the general assembly of North Carolina, which State then held jurisdiction over what is now Tennessee. In 1799 the area of the county was reduced to 625 square miles, and later by detaching small sections in the formation of Macon and Trousdale counties it was reduced to its present area of about 568 square miles.

The early settlers were largely from North Carolina, coming either direct from that State or from the Watauga settlements in East Tennessee, though some came from Virginia, South Carolina, and Pennsylvania. All these were known as Scotch-Irish. The present population is composed largely of descendants of these early pioneers. In recent years, however, people from other sections, particularly from the north, have made their homes in this county. The negro population is comparatively small. The population of the county as given by the last census was 26,072.

Gallatin, located in the south-central part of the county, on the main line of the Louisville and Nashville Railroad, is the county seat. It has a population of more than 3,000 and is a thriving business town and an educational center. Hendersonville and Portland, each having between 500 and 1,000 inhabitants, are the next towns of importance in the county; both are on the main line of the Louisville and Nashville Railroad. Hendersonville lies to the west of Gallatin, in the southwest part of the county. Portland, 14 miles north of Gallatin by railroad, is the center of the important tobacco section of Sumner County and the main shipping point for this product. It is also a shipping point for strawberries and cantaloupes, the production of which is rapidly increasing in the county. Westmoreland, with a population of about 500 and situated in the northeastern part

of the county, on the Scottsville branch of the Louisville and Nashville Railroad, is the shipping point for tobacco from that section of the county. There are, besides, a number of small stations along the railroad which in the ridge section are shipping points for lumber and cordwood.

The county is traversed north to south by the main line of the Louisville and Nashville Railroad, which affords excellent passenger and freight service direct to Louisville and Cincinnati, with connections to the north and south. From Gallatin a branch line extends east to Hartsville, in Trousdale County, and another north to Scottsville, in Kentucky. Transportation is also afforded by water on the Cumberland River.

County roads are numerous. In the southern part of the county, in the rolling Central Basin, a large number of the roads are toll pikes. In the "Ridge" section, which is mostly quite rough, the roads are not so good. Many of them follow the rocky beds or the immediate banks of the streams, and are in general quite rough. On the flat-topped ridges the roads are numerous and where possible are being straightened. Some of the roads are the remains of old turnpikes, but are not now kept up as such, though they are better than the average roads.

Louisville and Cincinnati afford the best markets for the general products of the farms, and shipments are made even to northern city markets. The tobacco is sold in the Clarksville market and much of it finally reaches Europe.

The rural free delivery of mail covers all parts of the county and telephone lines are in general use, very few farmhouses being without this modern convenience.

The interests of Sumner County are entirely agricultural. The southern part of the county lies in the bluegrass region of Tennessee, which is noted for its fine farms, producing grain, hay, pasturage, and live stock. The northern part, or "Ridge," is a part of the Clarksville district well known for the production of a superior quality of dark export tobacco. As an agricultural county Sumner ranks with the best in the State.

CLIMATE.

The only available climatological data obtainable for Sumner County are those of the Weather Bureau station at Nashville, in the adjoining county on the southwest. These figures represent fairly well the conditions of the Central Basin, but there is some difference no doubt between the climatic conditions in this part of the county and the Highland Rim. The season is known to be a little shorter in the latter section, there being fully a week's difference in the occurrence of frosts. A considerable difference is noticed also in the maturing of vegetables and other crops, the harvesting season be-

ginning a week or more earlier in the Central Basin. However, there is more than sufficient time to mature crops in both sections.

The mean annual temperature for Nashville, as shown by the appended table, is 59° F., with an absolute maximum of 104° and an absolute minimum of -13°, or an extreme range of 117°. Extreme cold spells are not frequent nor long continued. They are accompanied by snowfalls, the average annual depth of which is 10.2 inches.

There is considerable range in rainfall between the driest and wettest years, amounting to nearly 35 inches. The average annual precipitation is 48.6 inches, with more rainfall occurring in the winter and spring months than in the fall and summer months, at which times droughts are apt to occur. As a rule, however, the rainfall is sufficient in quantity and fairly well distributed throughout the year.

Normal monthly, seasonal, and annual temperature and precipitation at Nashville.

Month.	Temperature.			Precipitation.			
	Mean.	Absolute maximum.	Absolute minimum.	Mean.	Total amount for the driest year.	Total amount for the wettest year.	Snow, average depth.
	°F.	°F.	°F.	Inches.	Inches.	Inches.	Inches.
December	41	75	- 2	3.8	1.6	3.3	1.2
January	38	75	-10	4.8	2.8	3.7	2.6
February	41	77	-13	4.8	4.6	12.4	3.8
Winter	40			13.4	9.0	19.4	7.6
March	49	85	3	5.3	5.0	8.2	2.3
April	59	90	26	4.6	4.1	5.3	0.1
May	68	93	37	3.5	3.3	4.1	Trace.
Spring	59			13.4	12.4	17.6	2.4
June	76	99	42	4.2	3.0	4.0	0.0
July	80	102	56	4.4	1.6	5.7	0.0
August	78	104	51	3.4	2.4	2.2	0.0
Summer	78			12.0	7.0	11.9	0.0
September	71	99	38	3.7	1.0	5.4	0.0
October	60	92	27	2.3	1.3	7.2	Trace.
November	48	81	10	3.8	2.1	5.8	0.2
Fall	60			9.8	4.4	18.4	0.2
Year	59	104	-13	48.6	32.8	67.3	10.2

AGRICULTURE.

The early settlers of the "Cumberland country," of which Sumner County is a part, were far removed from the older eastern settlements and markets and were practically without means of communication,

there existing at the time only mere trails between this section and the Watauga settlement (the nearest settlement) in east Tennessee. A water route was possible by way of the Tennessee River and up the Cumberland, but this was long and tedious, and the trip was hazardous because of the hostility of the Indians. In 1786, in order to open up a more accessible route and to facilitate communication, the building of a road to the Watauga settlement was begun, connecting at the latter settlement with roads already built over the mountains into North Carolina and through the valleys of East Tennessee and of Virginia to Maryland and Pennsylvania. Baltimore at that time was the main base of supplies for this section of the South. This road did much to hasten the settlement west of the Alleghenies. New settlers began coming after the close of the Revolutionary war, these being mainly Revolutionary soldiers, who for services rendered were given warrants for land which they entered in the "Cumberland country." Another and shorter outlet was afforded later by the construction of the Louisville and Nashville turnpike, reaching navigation on the Ohio River at Louisville, Ky. Water transportation by flatboats was also begun soon after 1800 on the Cumberland to the Ohio, and thence down the Mississippi to New Orleans, the leading port of export for cotton and tobacco.

Being far removed from the older settlements and markets, it was necessary for the pioneers to produce nearly all their supplies, both of food and clothing. Corn was doubtless one of their first crops, and the first corn planted west of the Allegheny Mountains is said to have been in Sumner County. This was in 1777, and the following year the first crop of wheat was harvested. The growing of cotton and tobacco was begun at an early date, and in a few years these became the staple money crops of the county, being products that could be readily transported to market by the means at hand and being in great demand. Cotton was quite generally grown, but after 1850 the production decreased rapidly, as the conditions were not particularly suited to its production, and after the civil war its cultivation on any considerable scale ceased, though the census figures as late as 1890 showed a production of 11 bales. At the present time no cotton is grown in the county.

While the growing of tobacco began with the first settlement, it was not until 1810 that tobacco became of importance commercially, and from that date its production increased rapidly. The census of 1840 showed a production of 2,635,000 pounds in 1839.

The tobacco produced was known commercially as the "Up Cumberland," being the cheapest on the market. This sort of tobacco was grown in the Central Basin on limestone soils and made large yields, but after 1840 its production in the Central Basin or southern part of Sumner County was gradually discontinued and practically

none is produced there now. This tobacco was shipped in hogsheads by flatboats down the Cumberland, Ohio, and Mississippi rivers to New Orleans, where it found a market.

The year 1800 was an important one in the agricultural history of Sumner County, marking the introduction of bluegrass and the importation of the first blooded horse, two products that have made Sumner County noted. More blooded stock soon followed, but the value of bluegrass for pasture was not well recognized until 1838. It succeeded so well on the limestone soils of the Central Basin that it made possible the development of the live-stock industry. Sumner County soon became famous for its fine horses, and considerable attention was also given to the breeding of cattle and other domestic animals, with the result that the improvement of live stock has continued until the county now ranks in this respect considerably above the average for the State. Tennessee became noted for its mules and by 1860 was the leading mule-raising State, Sumner County being one of the important counties engaged in this industry.

Corn has continued to be the main staple crop of the county, its acreage equaling or exceeding the acreage of all other crops combined. From about 50,000 acres the annual production is 1,000,000 bushels or more. Wheat and oats have been the important small-grain crops, the acreage being about one-half that given to corn. The census of 1890 showed a decrease in wheat acreage, and considerable increase in the acreage of oats, whereas the census of 1900 reported an increase in wheat to 29,662 acres and a reduction in oats from 12,477 acres in 1890 to 3,303 acres. Barley and rye have been grown to a small extent, but the growing of barley, according to the authority quoted, has been practically discontinued. The acreage devoted to grass and hay crops has been considerable, the last census (1900) showing about 10,000 acres devoted to the different grass and forage crops cut for hay. Nearly one-third of the acreage was grain cut green and cured for hay. Timothy has been and is now the principal hay grass, though clover and millet and Hungarian grasses are also grown.

The reason for the abandonment of tobacco production in the Central Basin was the comparatively poor quality of the leaf. In changing from cotton and tobacco as money crops the farmers gave more attention to the production of cereals, and particularly to the raising of live stock. The natural adaptation of the Hagerstown soils in the Central Basin to bluegrass made the live-stock industry possible of great development and importance. Consequently the stock farm became most common in the southern portions of the county. On the "Ridge," or Highland Rim, it was found that the soils were better adapted to tobacco, producing a leaf of very much better quality, so that tobacco in the northern part of the county was

continued as the money crop in a system of general farming. These are the practices as found at the present time in the two radically different sections of the county.

While some farms in the Central Basin are devoted entirely to raising horses or mules, many others make cattle a specialty, particularly fattening for beef. In the last few years the raising of Shetland ponies has been started on a number of farms. Sheep are also raised, particularly on the rougher hilly lands adjacent to the Highland Rim escarpment. They are the coarse-wool breeds, the income being largely derived from the sale of fattened spring lambs. The importance of Sumner County with respect to live stock will be understood when it is known that more live stock is shipped from Gallatin to outside markets than from any other point on the Louisville and Nashville Railroad between Nashville Tenn., and Louisville, Ky.

A large part of the Highland Rim section of the county is so rough, hilly, and stony that the cultivated areas are more or less limited in extent. Cultivation is confined to the rolling crests, where relatively large cultivable areas occur, the flat or rolling tops of interstream areas, and the less steep stony slopes and narrow stream valleys. The acreage devoted to tobacco varies considerably. In 1900 the census showed 924 acres, yielding 569,140 pounds, while in 1889 there were 1,759 acres devoted to this crop, with a yield of 1,155,808 pounds, but in 1879 the acreage was only one-half that of 1899. Because of scarcity and high price of labor and the generally low price of tobacco, the acreage in the county is probably decreasing. Certain it is that some individual farmers do not plant the acreage they formerly did. The tobacco produced is an export type classed along with the Clarksville, but it does not have quite the quality of the latter, the leaf not being so thick, gummy, and leathery, nor so rich in nicotine. The tobacco is used in the export trade, and is sold principally in French and Spanish markets, though a small quantity goes to Italy and Germany.

On the stony slopes the crop that can be best cultivated is corn, which succeeds fairly well. On the flat to gently rolling lands on the crests and tops of interstream areas the small grains do well, wheat especially so where it follows tobacco, in this way getting some benefit from the heavy fertilization given the preceding crop. Irish and sweet potatoes are grown, but not on a commercial scale. On small areas near some of the railroad stations interest is being taken in special crops, such as strawberries and cantaloupes, particularly on the soils known as the Clarksville silt loam and Decatur silt loam. These soils are especially adapted to these crops, producing large yields of excellent quality. The transportation facilities are good. Fast express trains can put these products on the Louisville and Cin-

cinnati markets the morning after picking and a few hours later in more northern markets. There is a considerable area that could be devoted profitably to these crops. Raspberries and blackberries would no doubt be profitable, also. The latter grow wild in great abundance. Cherries and plums are plentiful and are shipped to market in considerable quantities. In the northern part of the county summer and early fall apples do exceptionally well and, as they come on the market at a time when high prices rule, prove profitable to those who grow them. It seems that apple growing would be an industry worth developing on the stony slopes. It is on similar soil in the Ozark region and in the valley of Virginia that apples do well.

In addition to farm products a considerable revenue is had from the forest products in the form of cordwood, railroad ties, and sawed lumber, especially on the Highland Rim. In the Central Basin considerable cedar is available and this is in great demand, particularly for use in making lead pencils. On the rougher lands forestry should be encouraged.

A systematic crop rotation is not followed in general over the county. In the Central Basin the rotation is corn, wheat, clover, and grass. The grass is mostly timothy, the timothy being sown in the fall on the wheat and the clover in the spring. The grass crop is cut for two years and then pastured. The main dependence for pasturage, however, is bluegrass, and a considerable part of each farm, especially the rougher areas, is in permanent bluegrass pasture. On the Highland Rim bluegrass does not succeed, so very little improved land is devoted to pasture. The main crops are corn, wheat, and tobacco, with very little attempt at rotation, except to follow tobacco with wheat so as to get the advantage of after effect of fertilizers used on the tobacco. Tobacco very rarely follows tobacco, as it is considered a crop that draws heavily on the strength of the land.

On lands where it is practicable improved modern machinery is used, but on the rough stony slopes such machinery is precluded and the labor is performed mainly by hand. Thus in harvesting the small grains the grain cradle or scythe is employed. Fertilizers are used, but in no great quantity, their use being confined largely to the tobacco crop. Applications of lime or "land plaster," not now common on the Hagerstown soils, are beneficial. Phosphatic fertilizers always benefit the "Ridge" lands—the Clarksville soils.

The size of farms varies considerably, ranging from about 50 to 400 acres. The average size for the county, according to the census of 1900, was 95.3 acres, a slight decrease in size as compared with preceding figures, the size in 1890 being given as 105 acres and in 1880 as 117 acres. According to the same authority more than one-half the land in farms is improved and 63 per cent of the farms are operated by their owners. The renting of farms is commonly on

the share basis, though a money rent, varying with the kind of land, is paid by some tenants, particularly for a crop of tobacco.

Farm labor is scarce and demands comparatively high wages. The hired labor is drawn mostly from the negro class and is fairly efficient. Because of the scarcity of laborers and their unwillingness to work for daily wage for periods covering only a part of the year the renting of farm lands is becoming more necessary.

There is a wide range in farm values over the county. In the Central Basin the price of farm lands varies from \$12 to \$125, or even more, an acre. The lower price is for the rougher stony areas. On the rolling lands of Hagerstown silt loam the farm improvements make the acreage value high. On most of the farms in this section there are large barns and outbuildings and costly dwellings and the fields are well fenced. The lands are naturally strong and productive and with little effort make good crops, which, together with the large number of good roads, especially turnpikes, give the farms a high value. In the "Ridge," or Highland Rim section, because of its roughness and general inaccessibility, the lands are less valuable, excepting the better gently rolling areas situated near towns on the railroad. Much of the "Ridge" section is in forest, and large areas are wild land, the value being dependent entirely upon the growth of timber. The better farms, however, bring from \$50 to \$75 an acre.

Conditions have improved greatly, it is said, in the northern part of the county within the last few years. There is great need in this section of better roads to facilitate wagon transportation. A more diversified system of cropping should be inaugurated, and systematic crop rotation, in which more grain and forage crops, especially the legumes, such as clover and cowpeas, should be grown.

The acreage in tobacco should be reduced, as the profits to the farmers are small. In close proximity to railroad stations the growing of vegetables, berries, and tree fruits for market should prove very profitable, and the introduction of these special crops is recommended. Finally, all the rougher lands should remain forested, removing the larger timber systematically, and along with forestry live-stock grazing could be carried on. It would seem that sheep raising would prove especially remunerative on these lands.

SOILS.

The soils of Sumner County are divided into two classes, residual and alluvial. The residual soils are those that have been derived from the weathering of the underlying rocks, while the alluvial soils represent sediment carried and deposited by the streams on their flood plains at times of high water. Exclusive of Rough stony land, nine types of soils were mapped, of which six types are of the residual class and three sedimentary or alluvial. The residual soils are the

most important and extensive, the alluvial soils occupying only a small part of the area of the county.

The residual soils owe their origin to limestones. The limestone, according to age, belongs to two systems, the Silurian and Subcarboniferous, and the rocks of these two systems, though both limestone, differ quite markedly in a number of respects, particularly in mineral composition. They have given rise to two soil groups, also showing distinct differences. The Silurian rock formations consist of beds of relatively pure massive limestone high in the carbonates of lime and magnesia. These carbonates are readily soluble in soil water. The purer limestones of the Central Basin are much more soluble than those of the Highland Rim, and as the soils in both places are only the indissoluble residue of the two classes of rocks, a basin has been formed where the purer limestones occurred.

The Silurian rocks have given rise to the Hagerstown series of soils, which are dark-colored soils of high natural productivity, the Hagerstown silt loam being the most important. The Hagerstown stony loam and Rough stony land are closely associated types and occupy areas where erosion has been more or less active in removing the fine earthy material, thus leaving on the surface an accumulation of rock fragments and exposed ledges of the bed rock. The Subcarboniferous, here represented by the St. Louis group of impure limestones with included cherty beds, has given rise to the Clarksville series of soils, which are light-colored silty soils of much lower productiveness than the soils of the Hagerstown series. This group of rocks has been quite resistant to weathering and to this fact is due the higher elevation of the Highland Rim. On the crests and wider interstream areas, where weathering was more complete and there was less erosion, there is a silty soil mass several feet in depth mapped as the Clarksville silt loam, while other areas of a reddish-brown soil underlain by deep red clay were mapped as Decatur silt loam. But where the St. Louis formations have been subject to much erosion, as on the slopes and narrow stream divides, much of the fine earth has been carried away, leaving an accumulation of fragments of the limestone and included cherty material on the surface and in the soil mass. This condition has been mapped as the Clarksville stony loam, the most extensive soil type in the county.

Along the lower courses of the creeks and the Cumberland River narrow flood plains and bottoms of silty material have been formed by wash from adjacent slopes, and also by sediments carried from farther up stream and more or less reworked and deposited. This is the Huntington silt loam, a strong productive soil especially suited to the growing of corn and grasses. Farther up stream on the smaller branches the narrow bottoms are more or less gravelly, and these areas have been mapped as the Huntington gravelly loam.

The Cumberland silt loam, though having an elevation of 50 to 100 feet above the Cumberland River, is an alluvial soil deposited at an early period, when the relative positions of the river and upland were different from what they are now. The soil material was probably largely local wash since modified by erosion.

Rough stony land is a miscellaneous term applied to those areas too rough and stony to cultivate and fit only for forestry and pasturage. Its occurrence is relatively small.

The following table gives the names and actual and relative extent of the several soil types mapped in the county:

Areas of different soils.

Soil.	Acres.	Percent.	Soil.	Acres.	Per cent.
Clarksville stony loam	112, 128	30.8	Huntington gravelly loam ..	6, 400	1.8
Hagerstown silt loam	82, 048	22.6	Cumberland silt loam	3, 584	1.0
Hagerstown stony loam	76, 800	21.1	Rough stony land	2, 368	.7
Clarksville silt loam	49, 280	13.6	Guthrie silt loam	832	.2
Huntington silt loam	19, 008	5.2	Total	363, 520	.....
Decatur silt loam	11, 072	3.0			

HAGERSTOWN SILT LOAM.

The Hagerstown silt loam, to a depth of 8 to 12 inches, consists uniformly of a friable light-brown to yellowish silty loam or silt loam, resting upon a subsoil which is generally slightly heavier than the soil or is a silty clay loam.

The subsoil is yellow or lighter in color than the soil—a difference largely due to a lower content of organic matter, though in some places the subsoil, especially in its upper portion, is often a brownish yellow. The subsoil extends to the underlying bed rock, which is found at depths varying from 4 to 20 feet. The soil is friable and open, as is also the subsoil, so that it is a comparatively easy type to cultivate and one in which good drainage conditions exist.

The Hagerstown silt loam is found in the Central Basin, which corresponds to the southern part of the county, extending from the terraces of the Cumberland River to the foot of the escarpment to the Highland Rim. It occurs in large bodies with very little interruption by other soil types. It occupies gently rolling to somewhat hilly country, the slopes being long and very gentle and with little if any flat or level areas. Its rolling surface permits good surface drainage and if care is not taken some damage is done the fields by washing, but this is easily stopped or prevented. The open, friable nature of the soil mass makes it capable of taking up a large quantity of water and retaining it. In very long dry spells, however, crops suffer from lack of moisture, though as on all soils of this class derived from

limestone they quickly recuperate with the occurrence of rain. Sink holes are common and a large part of the drainage is into them, for there are few small streams arising in this soil type.

The Hagerstown silt loam is of residual origin, being derived in place from the decomposition, mainly through solution, of pure limestones of a number of formations of Silurian age.

The resulting material represents impure or insoluble residuum of the original rock. As these limestone formations are so nearly pure it has taken an immense depth of rock to form the soil mass as found. Weathering has been complete and no rock fragments or outcrops occur in this type. Wherever rock fragments do occur the areas have been included either in the Hagerstown stony loam or Rough stony land.

This is a strong, productive soil adapted to grasses, and particularly to bluegrass, which affords the best of grazing. It is the soil that has made the whole Central Basin of Tennessee famous for its live stock. It also has a high agricultural value generally. Of the field crops corn does especially well, the yield averaging 40 to 50 bushels an acre, with a maximum close to 100 bushels. Wheat averages about 12 bushels per acre, but yields of 25 bushels are not uncommon. Oats will yield as high as 70 bushels, and the average is not far from 40 bushels. Its natural adaptation to bluegrass, however, gives this land its greatest value, and because of this the farms with but few exceptions are devoted to the raising of horses, mules, and cattle. The farms are as a rule large, are kept in good condition, the improvements are of high average value, and the fields are well fenced. Of the cultivated grasses, timothy and orchard grass thrive as well as bluegrass. Red clover also succeeds and yields of from 2 to 3 tons of hay per acre are not unusual.

In the early days tobacco was grown on this soil. The yield was large, but as the product was of inferior grade it sold for a low price. Some hemp was also produced.

The usual crop rotation on this soil consists of corn, wheat, clover, and grass. The grass is generally cut for two seasons and then pastured for a few years. The use of land plaster as well as lime on this soil gives beneficial results, but neither is applied to any extent at present.

The Hagerstown silt loam is practically all under cultivation. What timber growth now remains on it consists of maple, ash, hackberry, cedar, walnut, hickory, elm, some varieties of oaks, and some sycamore. At one time there was a rank undergrowth of cane.

Farms of the Hagerstown silt loam, with the improvements, have a high value, ranging from about \$40 to \$125 an acre, and very rarely is a farm now found for sale at any price.

The average results of mechanical analyses of samples of the soil and subsoil of the Hagerstown silt loam are given in the following table:

Mechanical analyses of Hagerstown silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
19696, 19702	Soil	1.1	3.8	1.7	2.3	7.8	69.3	13.9
19697, 19703	Subsoil	1.5	3.8	1.8	3.5	6.9	58.4	23.9

HAGERSTOWN STONY LOAM.

The surface soil of the Hagerstown stony loam, to a depth of 8 or 10 inches, consists of a brown silty loam, generally rather heavy but at the same time friable when cultivated. The subsoil grades from brown to yellow heavy silty loam, through silty clay loam, into a plastic silty clay. The deeper material is especially clayey where it rests upon the rock within 2 feet of the surface. Upon the surface and distributed through the soil mass are small fragments and larger blocks of more or less weathered limestone, and where the type lies on a slope capped by the formation giving the Clarksville stony loam there are found fragments from the more cherty upper formation, as well as fine earthy material derived therefrom and carried down and mingled with the soil, giving it a lighter color and influencing somewhat the texture and structure. The rock fragments, which vary in size from small chips to blocks several inches in diameter, are always in sufficient quantity to interfere more or less with cultivation. There also occur outcropping ledges of the bed rock, but where these are very much in evidence the areas have been included with Rough stony land.

As a whole, the soil of the Hagerstown stony loam is loose and friable, and especially so when newly cleared. When plowed it does not scour readily and is difficult to get in good condition. It is subject to erosion and considerable washing occurs, even though the stones on the surface and in the soil mass help to hold it together. On eroded slopes the underlying silty clay is often exposed.

The Hagerstown stony loam is one of the extensive soil types of Sumner County. In the Central Basin its largest development is between the Hagerstown silt loam and Clarksville stony loam, where it extends up the slopes from the gently rolling basin to the escarpment of the Highland Rim. The largest body lies in the east, south, and central parts of the county, and is rarely broken by other types. Areas also occupy the steeper slopes along the Cumberland River and tributary creeks. The type covers some of the rough sections of the county, consisting of narrow hills and ridges, the latter being irregular shaped with very steep slopes to narrow valleys. The tops of the

hills and ridges are 100 to 300 feet higher than the intervening valleys. As the steepness of the slopes permits a very rapid run-off of surface waters erosion is always active, and hence contour cultivation and the use of the stones for embankments are necessary to prevent washing.

The Hagerstown stony loam is a residual soil derived through weathering from Silurian limestones, though in part it represents materials from the more resistant rock. Its formation is the result of erosion, the soil being removed so rapidly that time is not given to form a soil mass of any great depth. Because of its position on steep stony slopes it is more difficult and more expensive to cultivate than the Hagerstown silt loam, and a large part of it, though cleared, is devoted to pasturage. It seeds naturally to bluegrass and is used more for cattle than horses, the smoother farms of the Hagerstown silt loam being preferred for horse grazing. Some sheep as well as cattle are pastured on these hilly lands.

Of the cultivated crops corn does the best, the yield varying from 15 to 60 bushels, with an average of about 30 bushels per acre. Small grains as a rule do not do so well as corn, and owing to the position and stony nature of the type, which prevent the use of harvesting machinery, it is not suited to grain farming. Tobacco has been grown upon it, but only in particular places is a desirable quality produced. Parts of this soil, particularly the upper slopes next to Clarksville stony loam, are said to be well adapted to peaches, the Elberta variety doing best.

The forest trees on this soil are thrifty and grow to good size. In some places cedars are a prominent growth. It would seem that the best uses of the Hagerstown stony loam are for pasturage and forestry, excepting, of course, those areas favorably located for cultivated crops. A good part of the type contains phosphate rock, and the richness or productiveness of the soil may be due in large part to the phosphate contained. Wherever phosphate deposits occur the value of the land is greatly enhanced. A number of phosphate mines in operation in the county are in this soil formation.

For agricultural purposes the land varies in value from \$5 to \$50 an acre, \$15 to \$25 being the ruling price.

The average results of mechanical analyses of fine-earth portions of the soil and subsoil of the Hagerstown stony loam are given in the following table:

Mechanical analyses of Hagerstown stony loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
19694, 21579	Soil	2.1	4.2	2.1	3.2	6.1	61.1	21.1
19695, 21580	Subsoil	1.1	3.2	1.6	2.6	2.5	58.1	30.9

CUMBERLAND SILT LOAM.

The soil of the Cumberland silt loam is a light-brown to yellow silt loam, containing a relatively high percentage of silt and having a depth of 6 to 12 inches. It occasionally carries some waterworn gravel. The subsoil is a yellow silty loam more compact than the surface soil.

Only a small extent of this soil is found in Sumner County, the areas being confined to the horseshoe bends of the Cumberland River in the southwest part of the county. It consists of sediments deposited by the river at a time when it occupied a higher elevation than at present. The material for the most part was probably of local origin, and represents the wash from near-by hills. As the river deepened its channel this material became a portion of the upland subject to erosion, and its surface features were gradually modified and changed until at the present time it is characterized by low, rolling hills and gently sloping forelands extending back from the river to the higher elevations occupied by soils of the Hagerstown series. Its position, 50 to 100 feet above the river, insures ample surface drainage. The structure of the soil is such that it retains sufficient moisture for successful plant growth, and it rarely suffers from drought. It is a rich, productive soil and is adapted to about the same crops as the Hagerstown silt loam, though the yields are usually not quite as large. The texture of the soil makes cultivation slightly easier than on the latter type. Its present value is about the same as that of the Hagerstown silt loam.

The results of mechanical analyses of samples of the soil and subsoil of the Cumberland silt loam are given in the following table:

Mechanical analyses of Cumberland silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
19700	Soil.....	0.5	1.3	1.0	4.5	9.1	66.1	17.3
19701	Subsoil .....	.1	1.0	1.0	3.9	6.9	64.1	23.0

CLARKSVILE STONY LOAM.

The soil of the Clarksville stony loam, to an average depth of 8 inches, consists for the most part of an ashlike silt or silty loam, although it varies somewhat in texture and other characteristics in different locations, on upper slopes being somewhat gritty and on lower slopes, where wash from upper slopes has collected, having greater depth, a darker color, and greater friability. The subsoil consists of a yellowish silt loam for a few inches, changing to yellow

or reddish-yellow silty clay loam, which at 30 inches or more in depth passes into a reddish silty clay and in some places into a deep red clay. In the eastern part of the county the red color is not so common, the yellow subsoil, very high in silt content, prevailing. Upon the surface and in the soil mass are found rock fragments, the quantity ranging from about 15 per cent to a mass with very little interstitial earthy material, but in all cases sufficient to interfere more or less with cultivation. The rock consists of limestone and chert.

The Clarksville stony loam occurs throughout the Highland Rim section of the county, for the most part in large irregular-shaped areas, which in the aggregate cover a large part of this section of the county. It is found on slopes where erosion has continually removed the finer material as it was formed, leaving the larger fragments behind. It is found on all the slopes to streams in conjunction with the Clarksville silt loam, on the escarpment leading from the Highland Rim to the Central Basin, and as areas capping the irregular-shaped hills above the Hagerstown stony loam. In the north-eastern part of the county, where it is most extensively developed, it occupies a very hilly, rough country, covering the tops as well as the slopes of hills and ridges. The crests of these hills and ridges maintain a general level, showing that the country was once a plateau and that the present topography is the result of erosion. The stream heads start sharply from the tops as deep, steep-sided ravines, which of course become deeper and are soon 200 or 300 feet below the general plateau level.

On steep slopes and narrow ridge tops the surface drainage, as might be expected, is good; in fact, the run-off is too rapid and erosion results where the fields are not cultivated with care. To prevent erosion contour cultivation is practiced and some terracing done. The stones play an important part in helping to hold the soil and to conserve soil moisture; but the slopes are so steep that they soon dry out, particularly those with southern exposures, so that the type is more or less droughty. Numerous springs, a considerable number of them constant flowing, are found in the ravines of the Clarksville stony loam, and the streams, except the branches that are not supplied by constant springs, carry water throughout the year. The streams are rapid flowing, with rocky beds, and are noted for their clearness, except at times of heavy rains, when they are soon surcharged with sediments.

The Clarksville stony loam is the result of the weathering and erosion of Subcarboniferous limestone with cherty beds, the particular formations being the Tullahoma and the overlying St. Louis. The Clarksville stony loam remains largely in forest, from which the larger part of the merchantable timber has been taken. The

present growth supplies a large number of railroad ties, as well as some lumber. The forest consists mostly of chestnut and several species of oak. In places where the white oak predominates the soil is called "white-oak land." Such areas usually lie on the tops of hills or ridges and the slopes with southern exposure. The northern slopes are recognized as growing the largest trees, and because of the occurrence here of poplars the land is sometimes called "poplar land." On the ridges chestnut is prominent, as well as oak; in the ravines larger trees of all species are found, poplar, hickory, black walnut, and butternut being important.

As a general rule only the gentler and lower slopes are cultivated. The main crop is corn, because it does quite well and the land is more easily cultivated to this crop. Corn yields from 15 to 25 bushels per acre. Tobacco is also grown to some extent, and on the less stony parts that approach the Clarksville silt loam in texture it produces about the same yield and quality as the latter type. The steep hillsides are not suitable for the small grain crops. Wheat gives generally low yields and the same is true of oats and rye. On the better parts this soil will seed to grass, but as a whole it does not afford good pasturage, broom sedge being the natural growth. This soil will produce good peaches, and is especially adapted to apples, particularly the early summer and fall varieties. Small fruits also do well. Wild blackberries of excellent quality grow in abundance. It would seem feasible to develop a fruit industry on parts of this type. The rougher parts could best be used for forestry, with some pasturage.

The value of this land varies according to location. In many places the forest growth is the determining factor in the valuation, ranging from \$1 or \$2 to \$25 an acre.

The average results of mechanical analyses of fine-earth samples of soil and subsoil of the Clarksville stony loam are given in the following table:

Mechanical analyses of Clarksville stony loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
21575, 21577	Soil.....	1.9	3.3	1.9	3.7	7.4	67.0	14.5
21576, 21578	Subsoil.....	1.1	1.8	.9	2.1	3.1	38.8	52.3

CLARKSVILLE SILT LOAM.

The surface soil of the Clarksville silt loam varies in depth from 8 to 15 inches, with an average of 10 inches, and consists of a friable silt loam which when moist has a soft smooth feel and when dry is

floury or powdery. The color of the immediate surface is a light or ashy gray, particularly light in cultivated fields when dry, though where some humus has been incorporated from time to time it maintains the light-brown color found in the virgin areas. Beneath the immediate surface the color soon changes to a light or grayish yellow. The subsoil consists of a yellow, compact, somewhat plastic silt loam, which may grade into a silty clay loam in the lower depths where it often becomes a reddish-yellow to yellowish-red color. The subsoil, which usually extends to a depth of several feet, is so compact that it is quite impervious to water and after heavy rains water stands upon the surface for some time.

When in proper moisture condition the soil is easily cultivated, but when handled too wet it puddles and becomes hard, forming clods in fields plowed in that condition which are broken down with some difficulty. It is as a rule entirely free from stone, though along the contact with the Clarksville stony loam there may be a small amount of chert and limestone fragments present.

The Clarksville silt loam occurs in the northern part of the county, on the Highland Rim. In the aggregate it occupies a considerable part of the area of the county, being one of the important and extensive soils. Its position is confined entirely to the broad, slightly rolling tops of the ridges. The largest areas are found around Portland, which is practically on the crest of the Highland Rim. The areas are as a rule flat or nearly so, there being only slight undulations in the larger areas. The land is known as "flatwoods," though a more common name is "white" or "gray land."

The generally level surface of this type does not allow ready surface drainage, except in the narrower areas, and the compact subsoil prevents ready percolation of water, so that, especially in the larger level areas, the drainage conditions are poor.

Much rainfall makes the soil very wet, and it takes considerable time for the sun and wind to evaporate the excess. The soil in its present condition is a late, cold soil, though if properly drained it would be much earlier and much more productive. Tile drains would, no doubt, be the most satisfactory and profitable means of providing drainage. The Clarksville silt loam during the summer, however, becomes very dry and the type as a whole is droughty. This condition could be prevented or at least alleviated by deep plowing and subsoiling. Where no very decided slopes occur very little damage results from erosion. It is noticeable, however, that roads on the level areas soon wear down below the general surface.

The Clarksville silt loam is of residual origin, being derived from the weathering of rock in place. The rock formation is a Silurian limestone known geologically as the St. Louis group and belonging to

the Subcarboniferous. Weathering of this rock has been deep seated and complete, and practically no stone fragments are found in the soil mass.

A considerable part of the Clarksville silt loam is under cultivation. It is the principal tobacco soil of the county and the same soil type upon which the Clarksville type of export tobacco is grown in Robertson and Montgomery counties. It is said, however, that it does not produce quite the quality of tobacco that is developed in the Clarksville district proper. Tobacco is grown on practically all the farms of this type of soil. Fertilizers are used without exception in producing the crop, the applications as a rule being heavy. The yield ranges from 600 to 800 pounds to the acre. Wheat, corn, oats, rye, and cowpeas are other crops grown. Wheat does exceptionally well, especially with fertilizers, nearly equaling the yields secured on the lands of the Central Basin. While the average is only 8 or 10 bushels per acre, 25 bushels or more is not a rare yield, and this could be secured. Corn does not succeed so well as wheat over much of the area with the best cultivation, which in part may be accounted for by late planting, necessitated by the wet condition of the soil in the spring, and in part by the droughty conditions that are likely to occur later at the critical stage in the formation of the grain. The average yield is about 25 bushels per acre. Cowpeas do exceptionally well on this soil, and other legumes also succeed, a number of wild species like the vetches being found everywhere. Of the tree fruits, cherries and apples do well. Apples of the summer and early fall varieties succeed best. They have been produced with profit in a small way and should receive more attention.

In rotating crops the general practice is to follow tobacco with wheat, the farmers claiming that after the tobacco crop there is enough fertilizer left in the soil to produce a good wheat crop. Corn and cowpeas generally follow the wheat.

The tree growth consists of several varieties of oak, beech, maple, chestnut, etc., while gum and post oak are found in the wetter locations. The trees for the most part are characterized by slim trunks and thin, spreading tops.

The following table gives the average results of mechanical analyses of the soil and subsoil of the Clarksville silt loam:

Mechanical analyses of Clarksville silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
21573, 21588	Soil.....	0.4	1.9	1.0	3.3	2.8	75.5	14.7
21574, 21584	Subsoil .....	.3	.8	.7	2.4	1.3	67.4	27.0

DECATUR SILT LOAM.

The Decatur silt loam consists of 8 to 10 inches of a brown to reddish-brown friable silty loam or silt loam, underlain by red silty clay loam, changing quickly to deep red silty clay, which extends to a depth of several feet. Often the upper subsoil is a silt loam, gradually becoming more clayey with depth. On the slopes erosion has removed the greater part of the soil, so that the underlying dark-red clay is in places exposed. In some places small fragments consisting of the chert and limestone are found, but these never occur in very great quantity or in sufficient areas to indicate separately.

The Decatur silt loam is found in the northwest part of the county, in the vicinity of Portland, with a few detached areas in the north-central part of the survey. Its areal extent is not large as compared with the soils with which it is associated, but agriculturally it is of considerable importance. The type occupies flat to gently rolling areas on the crest or domelike part of the Highland Rim around Portland, the areas being irregular and closely associated with Clarks-ville silt loam. The areas of the type along Red River and branches of Drake Creek, though extending down gentle slopes, have suffered by erosion.

As a whole the type is fairly well drained, the slopes being sufficient to favor surface run-off and the character of the soil mass allowing some percolation of the water downward. Tile drainage of the more level areas, however, should prove beneficial.

The Decatur silt loam is of residual origin, being derived from the purer parts of the St. Louis limestone, which the dark-red color of the subsoil would indicate contains considerable iron.

Nearly all the type is cleared and under cultivation, as it is a strong productive soil and lies well for cultivation. It is well adapted to general farming. Corn is one of the best crops, yielding on an average more than 30 bushels per acre, with maximum yields comparing with any of the soils of the county. Wheat yields about 15 bushels per acre and the yield of oats is large. It seems to be a good grass soil, producing good crops of timothy and clover hay and good pasturage. It will produce a heavier crop of tobacco than the Clarks-ville silt loam, or about 1,000 pounds per acre, but practically no tobacco is grown on this soil. In the vicinity of Portland strawberries of excellent quality are produced and large yields are secured. Other berries do equally as well.

The forest growth is large and thrifty. It consists of oak, walnut, locust, red cedar, gum, and other trees. The Decatur silt loam is a highly prized soil. Farms near the railroad are not for sale, and are held at \$50 to \$75 an acre. In the more remote places the value ranges as low as \$20 to \$25 an acre.

The average results of mechanical analyses of the soil and subsoil of the Decatur silt loam are given in the following table:

Mechanical analyses of Decatur silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
21581, 21585	Soil.....	0.2	0.9	0.9	3.8	3.0	69.6	21.5
21582, 21586	Subsoil .....	.2	.6	.5	2.2	1.1	57.5	37.6

GUTHRIE SILT LOAM.

The Guthrie silt loam occupies a few small wet, or swamplike, places in the depressions and sink holes occurring within areas of the Clarksville silt loam and Decatur silt loam. They are commonly known as "slashes" and are covered with a growth of gum and post oak and an undergrowth of shrubs and vines. The soil to a depth of 10 inches consists of a gray to drab silt loam. In some places, however, decayed organic matter has given the soil a dark color and it is sometimes almost mucky in character. The subsoil is a plastic silty clay generally of drab color or in the lower depths a mottled drab and white color. Except on the edges of the areas, the soil is so wet that it can not be cultivated, and it is always in an acid condition. In its present condition it has no agricultural value.

HUNTINGTON SILT LOAM.

The soil of the Huntington silt loam, to an average depth of 12 inches, consists of a light to dark brown heavy silt loam containing considerable organic matter. The subsoil consists of a compact silt loam sometimes slightly more clayey than the soil and ranging from a chocolate-brown to light-yellow color.

Soil of this type occupies the bottoms along the Cumberland River and its tributaries and the other large streams in the county. Along the Cumberland the largest areas are as much as one-fourth mile in width, but along the creeks the areas are merely narrow strips. These bottoms are all subject to overflow during periods of high water. Along the Cumberland the immediate banks are somewhat higher than the rest of the bottom and the soil contains considerably more fine sand than it does over most of the area, in which it is a moderately heavy though rather friable type.

The Huntington silt loam is best adapted to the growing of corn, giving yields of more than 50 bushels to the acre. It does well in grass, producing good hay crops and also excellent pasturage.

Wheat is less satisfactory, growing too rank and failing to head properly.

The results of mechanical analyses of soil and subsoil are given in the following table:

Mechanical analyses of Huntington silt loam.

Number.	Description.	Fine gravel.	Coarse sand.	Medium sand.	Fine sand.	Very fine sand.	Silt.	Clay.
		<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>	<i>Per cent.</i>
19698	Soil.....	0.1	0.2	0.1	1.9	20.9	59.6	17.1
19699	Subsoil .....	.0	.0	.0	.5	5.6	65.5	28.2

HUNTINGTON GRAVELLY LOAM.

The Huntington gravelly loam consists of the narrow bottoms along the smaller streams, the valleys of which extend back into areas of the Clarksville series of soils. It is influenced by wash from the contiguous slopes, small cherty fragments being carried to the stream and intermingled with the soil material.

The type is very similar to the Huntington silt loam. It consists of a light to dark brown, rather light silt loam, resting on a yellow or brownish-yellow silt loam, which at 24 inches or at some depth generally within the soil profile of 36 inches passes into a bed of gravel. Chert makes up the greater part of the fragments, which are usually angular, though a small proportion consists of rounded pieces of other kinds of rock.

Owing to its small extent the type is of very little importance, though it produces good crops of corn.

ROUGH STONY LAND.

Rough stony land occurs generally in areas of the Hagerstown stony loam, where the outcropping ledges of limestone are so extensive and numerous and often so steep that cultivation is impossible or at least rendered very difficult. It occurs as narrow caps or ridges, benches on slopes, and as the points of hills.

The type is scattered over the southern part of the county, occurring mainly in the southeastern and southwestern parts, but in the aggregate covers only a small area. The principal vegetation is red cedar. Where cleared the land affords some pasturage. The soil between the ledges being of limestone origin, supports bluegrass, and hence it has a higher value than many areas of this type. The cedar is valuable. It is used for fence posts and also in the manufacture of lead pencils.

SUMMARY.

Sumner County is one of the northern tier of counties of Middle Tennessee. It comprises an area of approximately 568 square miles.

One-third of its area, the southern part, is included in the Central Basin, the remainder occupying the Highland Rim. The Central Basin is characterized by its generally smooth, rolling surface, while the Highland Rim is more or less rough and broken, with the crests and larger interstream areas flat to gently rolling.

The larger part of the surface drainage of the county is either directly or indirectly into the Cumberland River, which forms the southern boundary of the county. The north-central and southwestern parts of the county drain into the Barren River in Kentucky.

The settlement of the area was begun in 1765, and the county was organized in 1786. The early settlers were mostly from North Carolina. The population of the county in 1900 was given as 26,072, of which negroes form a comparatively small proportion.

Gallatin is the county seat and largest town. Other important towns are Hendersonville, Portland, and Westmoreland.

The main line of the Louisville and Nashville Railroad traverses the county north and south. This road also has two branches within the county, the Scottsville and Hartsville. Water transportation is afforded by the Cumberland River.

Cincinnati is the principal market for the products of the county except tobacco, which is sold in the Clarksville market and finally shipped to countries in Europe.

Sumner County has a mild temperate climate. The annual mean temperature is 59° and mean annual precipitation 48.6 inches. A small part of the precipitation is in the form of snow.

Sumner County ranks with the best agricultural counties in the State. In the Central Basin portion the production of horses, mules, and beef cattle is of great importance. The growing of export tobacco is important in the northern part of the county on the Clarksville soils. In this section strawberries and cantaloupes are grown to some extent, and cherries, plums, and apples are produced for market, but in no great quantity.

The adaptability of soils to crops is recognized to some extent, particularly in case of tobacco. Crop rotation is not followed as a rule, but where practiced it consists of corn, wheat, and clover and grass. Where tobacco is grown it is always followed by wheat.

The average size of the farms is 95 acres, as reported by the Twelfth Census. Sixty-three per cent of the farms are operated by the owners. Labor is drawn largely from the negro race.

Land values vary considerably. The value of the rough, stony areas is determined largely by the timber growth, while the improved farms bring \$125 or more an acre.

The soils found in Sumner County are of two classes—residual and alluvial. The residual soils are derived from limestone formations differing widely in character.

In the Central Basin the most important soils are the Hagerstown silt loam and the Hagerstown stony loam types—strong and productive soils especially adapted to bluegrass. The former occupies the gently rolling lands and is the best general farming soil of the county. The Hagerstown stony loam, somewhat heavier than the loam, occurs on stony slopes and hills and is largely devoted to grazing purposes.

The Clarksville soils occupy the Highland Rim, are derived from more cherty limestones, and are relatively low in productiveness for limestone soils. The Clarksville stony loam is the most extensive type in the county. It is largely in forest of oak, chestnut, and a few other trees, and its best use is for forestry. Where cultivated it is best adapted to corn. Though considered a rather poor soil, with proper management it is made productive. It produces a heavy export tobacco. The Decatur silt loam is more productive than the Clarksville silt loam and a good general farming soil.

The Guthrie silt loam is of little value, occupying as it does the wet depressions and sink holes in the Highland Rim.

The alluvial soils have been classed as the Huntington silt loam and Huntington gravelly loam, both of which are productive soils, and the Cumberland silt loam, a productive soil occupying sloping terraces in the horseshoe bends of the Cumberland River.

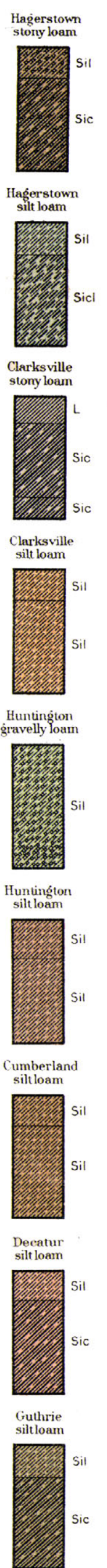
Rough stony land comprises areas too rough and stony for cultivation. It supports a growth of cedar, and being adapted to bluegrass, has a value for pasture.

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SOIL PROFILE
(3 feet deep)

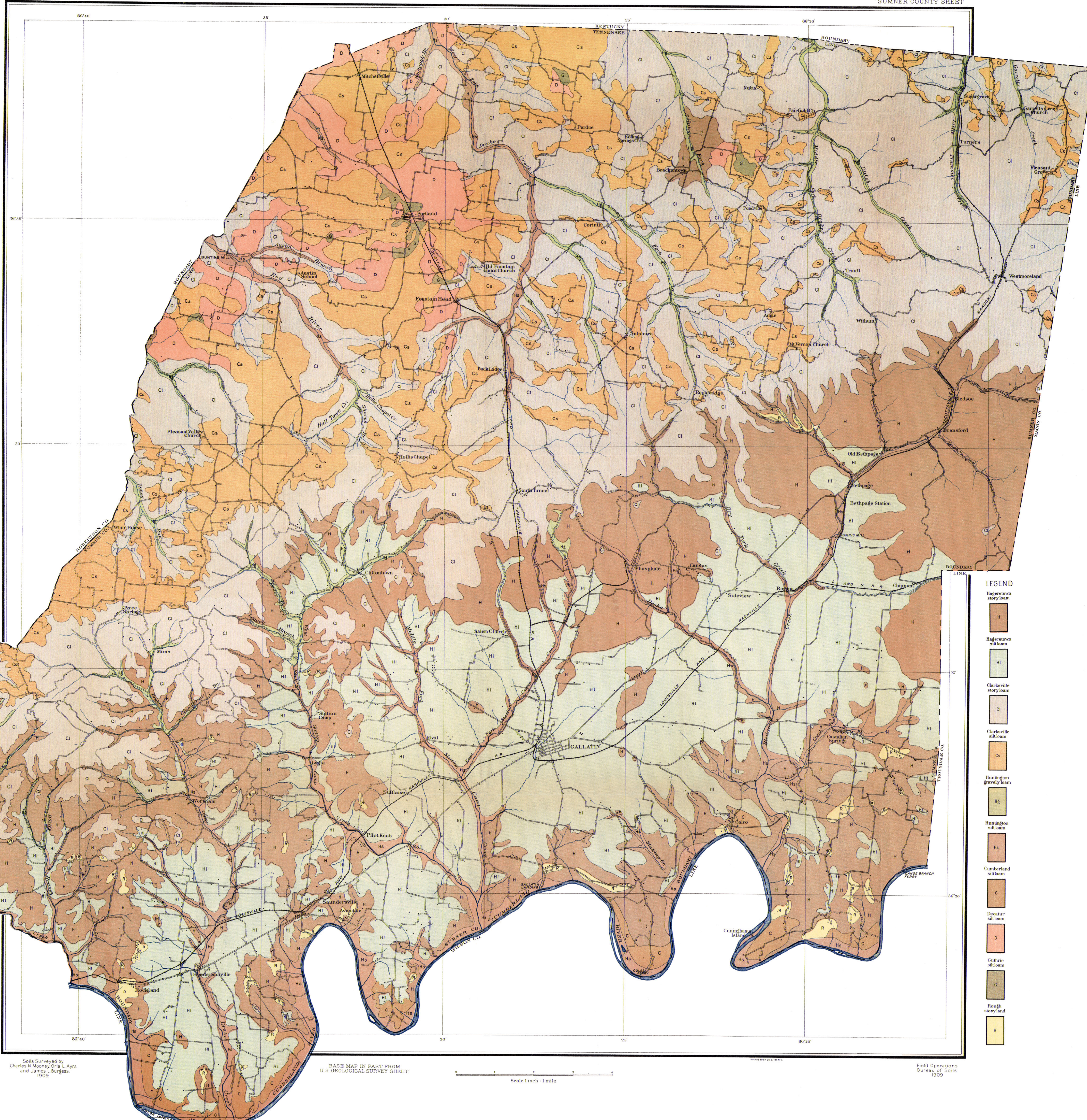


LEGEND

Silt Silt loam
Silt Silt clay loam
Silt Silty clay
L Loam

LEGEND

Hagerstown stony loam
Hagerstown silt loam
Clarksville stony loam
Clarksville silt loam
Huntington stony loam
Huntington silt loam
Cumberland silt loam
Decatur silt loam
Cuthrie silt loam
Rough stony land
R



Soils Surveyed by
Charles N. Mooney, Orla L. Ayrs
and James L. Burgess
1909

BASE MAP IN PART FROM
U. S. GEOLOGICAL SURVEY SHEET

Scale 1 inch = 1 mile

Field Operations
Bureau of Soils
1909